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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/573,184   | 11/01/2006  | Thomas Hofmann       | R.305990            | 4929             |
| 2119 7590 06/11/2008<br>RONALD E. GREIGG<br>GREIGG & GREIGG P.L.L.C.<br>1423 POWHATAN STREET, UNIT ONE<br>ALEXANDRIA, VA 22314 |             |                      |                     |                  |
| EXAMINER<br>NGUYEN, TU MINH  |             |                      |                     |                  |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
| 3748   |             |                      |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/573,184

**Applicant(s)**

HOFMANN ET AL.

**Examiner**

TU M. NGUYEN

**Art Unit**

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 13-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/5508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

### **DETAILED ACTION**

1. An Applicant's Amendment filed on February 27, 2008 has been entered. Claims 13, 19-21, 26-28, and 30 have been amended; and claims 33-34 have been added. Overall, claims 13-34 have been added and are pending in this application.

#### ***Claim Objections***

2. Claims 17-21, 31, 32, and 34 are objected to because of the following informalities:

- Claims 17-18, line 2 of each claim, --at least one of-- should be inserted following "comprising". Line 2 of each claim, "and/or" should read --and--. Also on line 2 of each claim, "controls and/or regulates" should read --at least one of controls and regulates at least one of--. Line 4 of the claim, "and/or" should read --and--.

- Claims 19-21, line 2 of each claim, "and/or" should read --and--.

- Claim 31, line 1 of the claim, "for a control and/or" should read --for at least one of a control and--.

- Claim 32, line 1 of the claim, "A control and/or" should read --At least one of a control and--.

- Claim 34, line 8 of the claim, --at least one of-- should be inserted following "comprising". Also on line 8 of the claim, "and/or" should read --and--. Line 9 of the claim, "controls and/or regulates" should read --at least one of controls and regulates at least one of--. Line 11 of the claim, "and/or" should read --and--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**4. Claims 13-24 and 26-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Peter-Hoblyn et al. (U.S. Patent 5,809,774).**

Re claims 13, 33, and 34, as shown in Figure 1, Peter-Hoblyn et al. disclose an internal combustion engine (40) having a fuel supply system (direct fuel injectors (42)), also having an exhaust treatment system for reducing pollutants in the exhaust, the exhaust treatment system comprising:

- a reservoir (10) containing an active ingredient (NOx-reducing reagent),
- a delivery device (23) for delivering the active ingredient, the delivery device is entirely separate from the fuel supply system (pump (23) pressurizes only a liquid solution of the active ingredient (NOx-reducing agent) for temporary storage in a pressure reservoir (30)),
- an injection device (valve (not numbered but clearly shown on line 32)) for injecting the active ingredient into the exhaust,
- a pressure reservoir (30) that is fed by the delivery device (23), wherein the pressure reservoir being able to store the active ingredient under pressure and being directly connected to the injection device, and

- at least one of a control and regulating device (control computer (line 66 of column 8)), which at least one of controls and regulates at least one of the pressure in the pressure reservoir as a function of the operating state (engine load) of the internal combustion engine and the time at which the injection of the active ingredient occurs (see lines 37-60 of column 8).

Re claim 14, in the engine of Peter-Hoblyn et al., the delivery device comprises a pre-supply pump (13) and a high pressure pump (23).

Re claims 15-16, the engine according to Peter-Hoblyn et al. further comprises a pressure regulating device (valve on line 34) connected to the pressure reservoir (30).

Re claims 17 and 18, the engine according to Peter-Hoblyn et al. further comprises at least one of a control and regulating device (control computer (line 66 of column 8)), which at least one of controls and regulates at least one of the delivery capacity of the delivery device, the pressure in the pressure reservoir, the time at which the injection of the active ingredient occurs, and the duration of an injection of the active ingredient as a function of the operating state (engine load) of the internal combustion engine (see lines 37-60 of column 8).

Re claims 19-21, in the engine of Peter-Hoblyn et al., at least one of the delivery device (13, 23) and the pressure reservoir (30) are of the type used in direct-injecting, fuel systems (fuel injectors (42)).

Re claims 22-24, in the engine of Peter-Hoblyn et al., the active ingredient is urea (line 6 of column 7).

Re claims 26-27, Peter-Hoblyn et al. further disclose a method for operating said internal combustion engine, wherein at least one of the delivery capacity of the delivery device, the pressure in the pressure reservoir, the time at which the injection of the active ingredient occurs,

and the duration of the injection of the active ingredient depend on the current operating parameters (engine load) of the internal combustion engine (see lines 37-60 of column 8).

Re claim 28, in the method according to Peter-Hoblyn et al., the operating parameters include at least one of a torque of the engine, a temperature (temperature sensor (51)) before a catalytic converter (60), and an NO<sub>x</sub> content (NO<sub>x</sub> sensor (45)) in the exhaust.

Re claims 29-32, Peter-Hoblyn et al. further disclose a control unit, a computer program, and an electric storage medium of said internal combustion engine, operable to store said computer program to be used in the claimed method.

*Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peter-Hoblyn et al. as applied to claim 22 above, in view of Goerigk et al. (U.S. Patent Application 2002/0023433).**

The engine of Peter-Hoblyn et al. discloses the invention as cited above, however, fails to disclose that the engine further comprises means to heat the pressure reservoir.

As shown in Figure 1, Goerigk et al. disclose a system for feeding a reducing agent into a catalyst device, comprising a urea solution tank (6), a reducing agent pump (7), and an injection

valve (8). As indicated in paragraph 0048, Goerigk et al. teach that it is conventional in the art to heat the tank, pump, and valve to prevent freezing of the system. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teachings by Goerigk et al. in the engine of Peter-Hoblyn et al., since the use thereof would have been routinely practiced by those with ordinary skill in the art to allow the exhaust system to operate efficiently during period of low temperature.

#### ***Response to Arguments***

7. Applicant's arguments with respect to the references applied in the previous Office Action have been fully considered but they are not persuasive.

In response to applicant's argument that Peter-Hoblyn et al. fail to disclose or suggest "a pressure reservoir to store the active ingredient under pressure" (page 9 of the Applicant's Amendment), the examiner respectfully disagrees.

Similar to the pending application, Peter-Hoblyn et al. also utilize a pump (23) to pressurize a liquid solution of the active ingredient which is then stored in reservoir (30). Since the reservoir (30) is adapted to store a pressurized liquid and that this is consistent with a definition provided in the pending application (see paragraph 0027), the reservoir (30) in Peter-Hoblyn et al. is considered to be a "pressure reservoir". Moreover, as illustrated in Figure 1, the liquid solution in the reservoir (30) of Peter-Hoblyn et al. is clearly under high pressure because there is only a valve (32) between the reservoir and the exhaust line (44). There is no pump between the reservoir (30) and the exhaust line (44) to pump the liquid solution out of the reservoir and into the exhaust line.

In response to applicant's argument that Peter-Hoblyn et al. fail to disclose or suggest a control and regulating device to control and regulate the time at which the injection of the active ingredient occurs (page 10 of the Amendment), the examiner again respectfully disagrees.

The text on lines 38-48 of column 8 in Peter-Hoblyn et al. reads as follows:

*"The NO<sub>x</sub> emissions from an engine are typically small at idle and low-load conditions when fuel consumption is the least, and greatest at high-load conditions where fuel consumption is greatest. From a very practical standpoint, it is an advantage that the invention permits regulating the flow of NO<sub>x</sub> reducing reagent in proportion to NO<sub>x</sub> production. At idle and under low-load conditions, it is expected that exhaust gas temperatures will be too low for SCR to react the gasified NO<sub>x</sub>-reducing reagent effectively with the NO<sub>x</sub>, in which case it may be required for reagent flow to be stopped."* (emphasis added by examiner)

Based on the above disclosure, Peter-Hoblyn et al. disclose or teach that the flow of the active ingredient is timed in accordance to an operating condition of the engine. They allow the flow when the engine is at high load condition and stop the flow when the engine is at low load condition. Therefore, Peter-Hoblyn et al. clearly disclose the claimed limitation in dispute.

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after



the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### *Communication*

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMN  
June 8, 2008

/Tu M. Nguyen/  
Tu M. Nguyen  
Primary Examiner  
Art Unit 3748